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Passenger Vehicle Weight and Driver Injury Severity



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Summary

This report updates estimates of driver injury rates in towaway crashes that were presented in *Passenger Car Weight and Injury Severity in Single-Vehicle Nonrollover Crashes* (Susan C. Partyka and William A. Boehly, published in the proceedings of the Twelfth International Technical Conference on Experimental Safety Vehicles, 1989). The earlier report used 1981 to 1986 National Accident Sampling System (NASS) data for passenger cars. This report adds the 1988 to 1993 NASS data, and it adds data for light trucks (that is, for utility vehicles, passenger vans, and pickup trucks).

The data show higher injury rates in lighter cars and suggest that there would have been 2,053 more drivers with moderate and more severe injury in towaway crashes in 1993 if all cars were one hundred pounds lighter. The comparisons between large and small versions of utility vehicles, passenger vans, and pickup trucks also tend to show higher moderate injury rates in the smaller versions.

The 1989 paper included an estimate that the 386-pound weight reduction in the passenger car fleet that occurred between the 1980 and 1987 was associated with a 5.56 percent increase in driver moderate injuries in single-vehicle nonrollover crashes, which is equivalent to a 1.44 percent increase for a 100-pound weight reduction. This is consistent with the 1.48 percent increase for a 100-pound weight reduction estimated here for all vehicle-to-object crashes.

Data

There were 87,961 drivers in towed light vehicles investigated by NASS during the 12 years from 1981 to 1993; there was no NASS estimation file for 1987. For this analysis, drivers were categorized in terms of injury outcome (fatality or survivor) and injury severity (using the Abbreviated Injury Scale -- AIS). Of these drivers:

17,886 were moderately injured (AIS 2 or greater, or fatality),
8,187 were seriously injured (AIS 3 or greater, or fatality), and
2,985 were killed.

Restricting the data to more-recent model years or calendar years reduces the amount of data available for injury rate comparisons. For example, there were only 21,150 drivers of 1985 to 1993 model year light vehicles who were investigated by the 1989 to 1993 NASS (including 5,122 who were moderately injured, 2,360 who were seriously injured, and 782 fatalities). Restricting the data in this way would eliminate three-quarters of the observations. Therefore, this report uses twelve years of data and does not restrict the data to the more-recent experience.

Method

Light passenger vehicles were classified as passenger cars, utility vehicles, passenger vans, or pickup trucks using the NASS body type variable.

Passenger cars were divided into six classes based on the vehicle curb weight reported by the NASS investigators. The classes were defined in the standard 500-pound categories used by the agency, as follows:

Minicompact	= up to 1,949 pounds
Subcompact	= 1,950 through 2,449 pounds
Compact	= 2,450 through 2,949 pounds
Intermediate	= 2,950 through 3,449 pounds
Fullsize	= 3,450 through 3,949 pounds
Largest	= 3,950 pounds and over.

Utility vehicles were divided into the three subcategories defined by the 1992 and 1993 NASS body type: compact utility vehicles, large utility vehicles, and utility station wagons. Utility vehicles in cases investigated between 1981 and 1991 were reclassified into the later scheme using the reported vehicle make, model, and model year. Passenger vans were classified as either minivans or large vans, and pickup trucks were classified as either compact pickup trucks or large pickup trucks, as defined by the 1988 through 1993 NASS body type. Passenger vans and pickup trucks in cases investigated between 1981 and 1986 (as well as miscellaneous vehicles, such as pickup trucks with slide-in campers and convertible pickups) were reclassified into the later scheme using the reported vehicle make and model.

Damage type was defined by the most-severe damage to the vehicle. Impact type was defined by the object associated with the primary damage: "vehicle-to-vehicle" crashes are those with the primary damage caused by contact with another vehicle, and "vehicle-to-object" crashes are those with any other identified contact for the primary damage.

The NASS data are stored as Statistical Analysis System (SAS) files, and SAS was used to create the tables included here. The tables show the number of investigated cases, the national estimates produced by statistically weighting the data (using the national inflation factors), and relevant percentages for thresholds of moderate, serious, and fatal injury. NASS is a statistical sample, and estimates derived from NASS contain both sampling and nonsampling errors. Some idea of the reliability of the estimates is suggested by the number of investigated cases on which each estimate is based, with estimates based on only a few cases being particularly susceptible to sampling error.

Injury Rates in Passenger Cars

Table 1 and Figure 1 show a tendency of decreasing moderate injury rates with increasing passenger car weight for crashes of all types combined, with injury rates of:

10.30 percent	in minicompact cars,
10.25 percent	in subcompact cars,
8.92 percent	in compact cars,
8.30 percent	in intermediate cars,
7.31 percent	in fullsize cars, and
7.55 percent	in the largest cars.

A simple regression line was fit through the six data points, with the weight classes assigned the following values:

Minicompact:	17 hundred pounds
Subcompact:	22 hundred pounds
Compact:	27 hundred pounds
Intermediate:	32 hundred pounds
Fullsize:	37 hundred pounds
Largest:	42 hundred pounds.

Summary Table 1: Linear Models of Moderate Injury Rates as a Function of Car Weight

Accident Type	R-square	Pr>T	Intercept	Weight Coefficient	Injury Rate At 3000 Pounds	Injury Rate At 2900 Pounds	Effect of 100 Pound Car Weight Reduction	Are R-sq>0.25 and Pr<0.15?
All	0.92	0.0028	12.68084	-0.13251	8.705	8.838	1.52%	yes
All vehicle	0.93	0.0018	11.98821	-0.14463	7.649	7.794	1.89%	yes
All object	0.87	0.0061	18.09189	-0.18566	12.522	12.708	1.48%	yes
Rollover, all	0.29	0.2673	21.64840	-0.11520	18.192	18.308	0.63%	no
Rollover, vehicle	0.15	0.4479	50.10989	-0.59966	32.120	32.720	1.87%	no
Rollover, object	0.01	0.8736	17.73625	0.02126	18.374	18.353	-0.12%	no
Front, all	0.83	0.0112	14.80657	-0.15971	10.015	10.175	1.59%	yes
Front, vehicle	0.95	0.0010	13.68270	-0.16811	8.639	8.807	1.95%	yes
Front, object	0.52	0.1053	19.57038	-0.21114	13.236	13.447	1.60%	yes
Side, all	0.77	0.0211	13.34669	-0.09006	10.645	10.735	0.85%	yes
Side, vehicle	0.82	0.0126	13.28659	-0.10977	9.993	10.103	1.10%	yes
Side, object	0.13	0.4746	15.60579	-0.06737	13.585	13.652	0.50%	no

The fitted line through the data for all crash types combined has an R-squared of 0.92 for the equation:

$$\text{Moderate Injury Rate} = 12.68084 - 0.13251 * \text{Hundred pounds of car weight.}$$

The coefficient of the car weight variable is statistically significant and suggests that the moderate injury rate decreases by about 0.13 percentage points for each additional hundred pounds of car weight.

Table 1 includes separate estimates of injury rates in vehicle-to-vehicle and vehicle-to-object crashes. These comparisons also suggest that heavier cars are associated with lower moderate injury rates. Tables 2 through 8 use the same type of presentation, with the data limited to all rollover crashes (Table 2), nonrollover frontal crashes (Table 3), nonrollover side crashes (Table 4), nonrollover impacts to the back of the vehicle (Table 5), other nonrollover crashes (that is, crashes that produced undercarriage and top damage, Table 6), nonrollover crashes to an unknown area (Table 7), and crashes for which the rollover status was unknown (Table 8). The data for rollover, front, and side impacts with all primary contacts are plotted as Figure 2.

Linear models were fit to subsets of the data defined by impact type and damage area. The results (shown in Summary Table 1) suggest that a 2900-pound car has a driver moderate injury rate that is 1.52 percent higher than that of a 3000-pound car. This 100-pound weight reduction is associated with injury rates that are estimated to be 1.89 percent higher in vehicle-to-vehicle crashes and 1.48 percent higher in vehicle-to-object crashes.

There is no apparent association between the moderate injury rate and car weight in rollover crashes. In particular, the linear model through the data for moderate injuries in vehicle-to-object rollover crashes has an R-squared of 0.01 and a coefficient of 0.02 for the weight variable; this is essentially a horizontal line. The 100-pound weight reduction is associated with higher injury rates in nonrollover frontal crashes (an estimated 1.59 percent overall, 1.95 percent in vehicle-to-vehicle crashes, and 1.60 percent in vehicle-to-object crashes) and in nonrollover side crashes (an estimated 0.85 percent overall and 1.10 percent in vehicle-to-vehicle crashes).

The estimated models of car weight and injury rate can be used to estimate the effect of a 100-pound fleet-wide passenger car weight reduction. Table 9 shows the estimated number of driver moderate injuries in towed passenger cars in 1993, based on the weighted NASS data (with unknown impact type and damage area prorated among the known categories). Applying the overall effect (an estimated 1.52 percent increase in moderate injuries for a 100-pound reduction in car weight) suggests there would have been 2,053 more moderate injuries in 1993 if cars had been 100 pounds lighter. This increase reflects the protective benefits of car size and weight in crashes, as well as the susceptibility of smaller and lighter cars to rollover. Injury rates are higher in rollover (compared to nonrollover) crashes, and the NASS data show that rollovers account for a higher proportion of lighter car crashes.

Applying the statistically-significant results from Summary Table 1 to the estimated numbers of moderate injuries in 1993 produces estimates of the effect of a 100-pound weight reduction for specific nonrollover crash types. This weight reduction would produce estimated increases of:

885 injuries in frontal vehicle-to-vehicle crashes,
411 injuries in frontal vehicle-to-object crashes, and
302 injuries in side vehicle-to-vehicle crashes.

The combined effect is an estimated 1,598 increase in the number of driver moderate injuries in these nonrollover crashes. The results are shown in Summary Table 2.

Summary Table 2: Effect of a 100-Pound Weight Reduction on the Number of Car Driver Moderate Injuries in 1993

Crash Type	Annual Driver Moderate Injuries	Effect of 100 Pound Weight Reduction	Change in Moderate Injuries
Rolling over with vehicle impact	985	ns	-
Rolling over without vehicle impact	15,029	ns	-
Frontal impact into vehicle	45,455	+ 1.95%	+ 885
Frontal impact into object	25,791	+ 1.60%	+ 411
Side impact into vehicle	27,533	+ 1.10%	+ 302
Side impact into object	16,510	ns	-
Total of these	131,304	+ 1.22%	+ 1,598

("ns" means that the results were not statistically significant)

The 1989 paper included an estimate that the 386-pound weight reduction in the passenger car fleet that occurred between the 1980 and 1987 was associated with a 5.56 percent increase in driver moderate injuries in single-vehicle nonrollover crashes. This result was based on an analysis of the 1981 to 1986 NASS data plus data from three states (1980 to 1987 data from North Carolina, 1980 to 1987 data from Maryland, and 1982 to 1987 data from Michigan). The estimated injury increase for a 386-pound car weight reduction found in 1989 is equivalent to a:

$$5.56 / 3.86 = 1.44 \text{ percent increase}$$

for a 100-pound weight reduction. This increase from the earlier analysis is consistent with the 1.48 percent increase for a 100-pound weight reduction in all vehicle-to-object crashes estimated here in the updated analysis (after noting that there appears to be no association between car weight and moderate injury in the vehicle-to-object rollover towaway crashes included there).

Injury Rates in Light Trucks

The data in Table 1 show that the estimated moderate injury rates in utility vehicles in all types of crashes were lower for compact utility vehicles (11.12 percent) than for large utility vehicles (12.28 percent); the injury rate was 4.99 percent in utility stationwagons (based on 40 moderately-injured drivers). In vehicle-to-vehicle crashes, the injury rate was lower in compact utility vehicles (8.85 percent) than in large utility vehicles (9.49

percent -- based on 48 moderately-injured drivers). In vehicle-to-object crashes, the injury rate was higher in compact utility vehicles (13.15 percent) than in large utility vehicles (12.65 percent -- based on 85 moderately-injured drivers).

The estimated moderate injury rates in passenger vans were higher in minivans (9.75 percent) than in large vans (8.49 percent). The injury rate in vehicle-to-vehicle crashes was higher in minivans (9.13 percent) than in large vans (5.84 percent). The injury rate in vehicle-to-object crashes was lower in minivans (10.86 percent -- based on 79 moderately-injured drivers) than in large vans (13.77 percent).

The estimated moderate injury rate in pickup trucks was higher in compact pickup trucks (9.73 percent) than in large pickup trucks (8.19 percent). In vehicle-to-vehicle crashes, the injury rate was 8.76 in compact pickup trucks and 6.70 percent in large pickup trucks. The injury rates in vehicle-to-object crashes were 13.58 and 12.20 percent, respectively.

The comparison of moderate injury rates among drivers of light trucks suggests that the smaller versions tend to have higher injury rates than do the larger versions, but some of the differences are small. The driver moderate injury rate was higher in the smaller version of the pair for six of the nine comparisons, as shown in Summary Table 3. That is, compact utility vehicles in vehicle-to-object crashes had higher injury rates than did large utility vehicles, minivans in vehicle-to-vehicle crashes and in all crash types combined had higher injury rates than did large vans, and compact pickup trucks in vehicle-to-vehicle crashes, in vehicle-to-object crashes, and in all impact types combined had higher injury rates than did large pickup trucks.

Summary Table 3: Moderate Injury Rates
in the Smaller (Compared to the Larger)
Versions of Light Trucks

Light Truck Type	Impact Type		
	Vehicle -to- Vehicle	Vehicle -to- Object	All Impact Types
Utility vehicles	Lower	Higher	Lower
Passenger vans	Higher	Lower	Higher
Pickup trucks	Higher	Higher	Higher

In rollover crashes (Table 2), the estimated moderate injury rates were slightly lower in compact utility vehicles (16.67 percent) than in large utility vehicles (17.11 percent -- based on 80 moderately-injured drivers), slightly lower in minivans (18.61 percent -- based on 51 moderately-injured drivers) than in large vans (18.39 percent), and lower in compact pickup trucks (15.71 percent) than in large pickup trucks (16.85 percent).

In nonrollover crashes with front damage to the light truck (Table 3) the moderate injury rate was lower in compact utility vehicles than in large utility vehicles (7.75 percent and 8.67 percent respectively). The injury rates in passenger vans and pickup trucks were higher in the smaller version of each pair of vehicle body types: 12.08 percent and 9.91 percent for minivans and large vans, and 10.80 percent in compact pickups and 9.17 percent in large pickup trucks.

In nonrollover crashes with side damage to the light truck (Table 4) the injury rates in utility vehicles and passenger vans were higher in the larger version of each pair of vehicle body types for all crashes combined. The moderate injury rates were higher in compact pickup trucks (12.29 percent) than in large pickup trucks (10.98 percent).

Moderate injury was relatively rare in nonrollover impacts to the back of these vehicles (Table 5) and other nonrollover impacts (Table 6), and it is

difficult to interpret the results for cases with unknown damage area or unknown rollover status (Tables 7 and 8).

Differences in Vehicle Use

Table 10 (investigated cases) and Table 11 (weighted data) show that the change in vehicle velocity during impact (delta V) in nonrollover frontal crashes tends to be higher for lighter cars than for heavier cars. For example, the estimated percentages of towaway crashes that involved delta Vs of less than 10 miles per hour (mph) were:

- 10 percent of all nonrollover frontal minicompact car crashes,
- 12 percent of all nonrollover frontal subcompact car crashes,
- 22 percent of all nonrollover frontal compact car crashes,
- 25 percent of all nonrollover frontal intermediate car crashes,
- 22 percent of all nonrollover frontal fullsize car crashes, and
- 31 percent of all nonrollover frontal largest car crashes.

In contrast, the estimated percentage of towaway crashes that involved delta Vs of at least 40 mph were:

- 0.90 percent of all nonrollover frontal minicompact car crashes,
- 0.71 percent of all nonrollover frontal subcompact car crashes,
- 0.48 percent of all nonrollover frontal compact car crashes,
- 0.62 percent of all nonrollover frontal intermediate car crashes,
- 0.36 percent of all nonrollover frontal fullsize car crashes, and
- 0.31 percent of all nonrollover frontal largest car crashes.

The higher delta Vs for the lighter cars reflect the combination of how they were driven, their weight disadvantage in multi-vehicle crashes, the effect of curb weight in single-vehicle crashes, and any possible biases in the delta V estimation methods. It is not clear that it is appropriate to statistically adjust the data for the delta V differences, since some of the difference may reflect real protective benefits to drivers of heavier vehicles.

Table 12 (investigated cases) and Table 13 (weighted data) show that drivers of heavier cars tend to be older than drivers of lighter cars. For example, the estimated percentage of towaway crashes that involved drivers under 20 years of age was:

- 23 percent of all minicompact car crashes,
- 21 percent of all subcompact car crashes,
- 19 percent of all compact car crashes,
- 18 percent of all intermediate car crashes,
- 16 percent of all fullsize car crashes, and
- 14 percent of all largest car crashes.

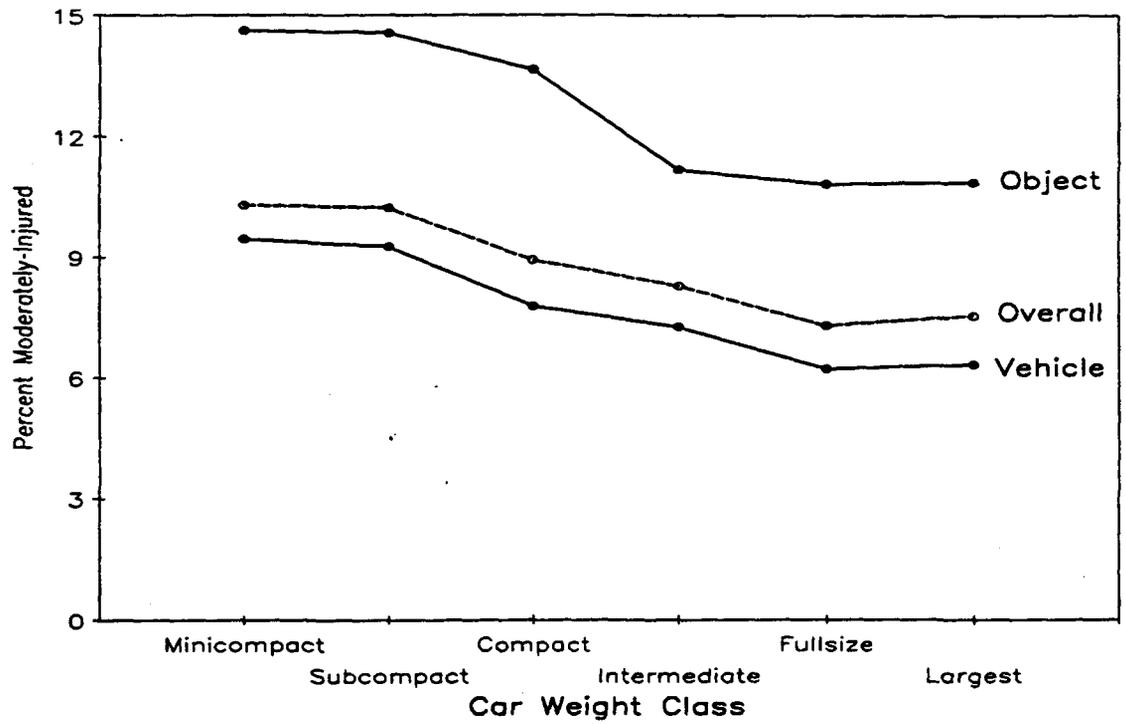
The estimated percentage of towaway crashes that involved drivers 55 years or older was:

- 5 percent of all minicompact car crashes,
- 8 percent of all subcompact car crashes,
- 12 percent of all compact car crashes,
- 13 percent of all intermediate car crashes,
- 19 percent of all fullsize car crashes, and
- 20 percent of all largest car crashes.

The tendency of older drivers to use heavier vehicles suggests weight-specific differences in vehicle use (including travel speed and crash conditions) and driver vulnerability to death and injury when involved in a crash. These two types of effects may offset each other to some extent.

Figure 1 (top) and Figure 2 (bottom)

Driver Moderate Injury Rates in Crashes of All Types, by Primary Contact



Driver Moderate Injury Rates for All Crash Contacts, by Damage Type

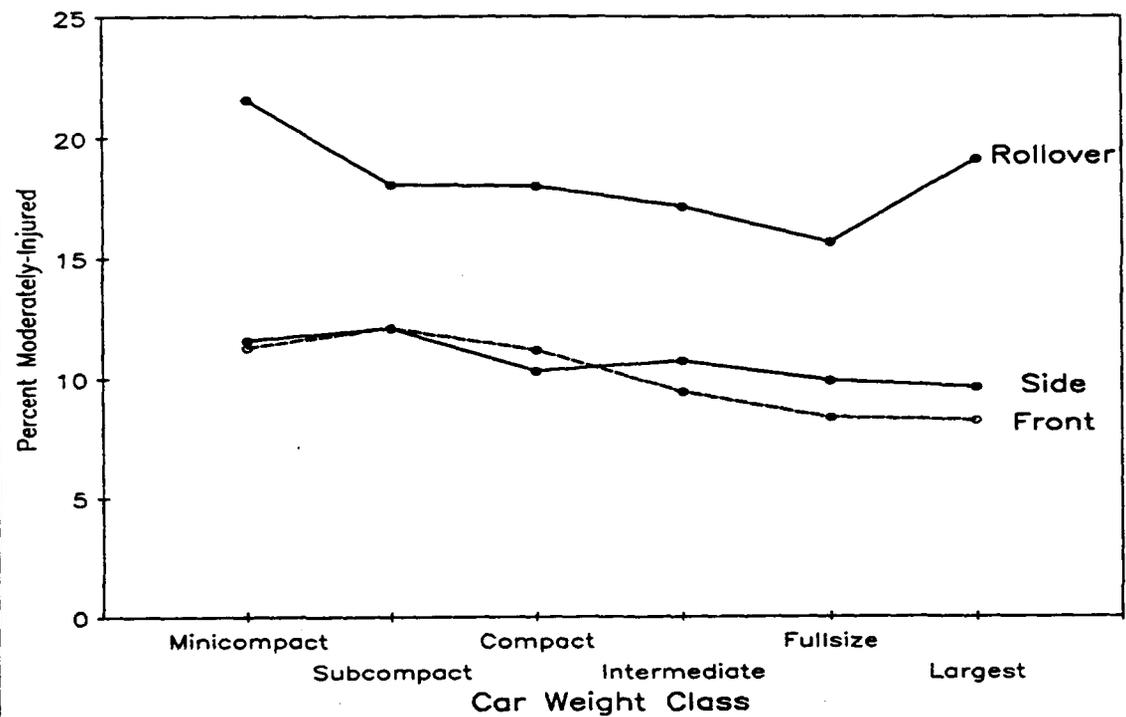


Table 1: Driver Injury Rates in NASS Towaway Crashes

Crash Type	Vehicle Type	Investigated NASS Cases				Twelve-Year National Estimates				Injury Rates		
		Total	AIS>=2	AIS>=3	Fatal	Total	AIS>=2	AIS>=3	Fatal	AIS>=2	AIS>=3	Fatal
Overall	All Light Vehicles	87,961	17,886	8,187	2,985	30,838,352	2,691,053	854,007	205,222	8.73	2.77	0.67
Overall	Car Minicompact	3,672	900	410	144	1,299,082	133,752	46,986	9,764	10.30	3.62	0.75
Overall	Car Subcompact	17,378	4,111	1,795	603	6,111,606	626,449	179,503	39,372	10.25	2.94	0.64
Overall	Car Compact	16,292	3,561	1,585	558	5,766,963	514,273	160,817	36,329	8.92	2.79	0.63
Overall	Car Intermediate	14,733	2,830	1,305	506	5,203,397	431,944	131,040	31,368	8.30	2.52	0.60
Overall	Car Fullsize	9,695	1,626	762	283	3,170,704	231,729	79,671	21,323	7.31	2.51	0.67
Overall	Car Largest	7,744	1,100	485	184	2,524,219	190,681	65,533	17,086	7.55	2.60	0.68
Overall	Car Unknown	1,583	149	74	32	927,803	34,239	8,505	2,535	3.69	0.92	0.27
Overall	Utility Compact	1,721	447	210	83	573,806	63,787	16,781	5,349	11.12	2.92	0.93
Overall	Utility Large	684	148	74	36	204,612	25,122	7,644	2,608	12.28	3.74	1.27
Overall	Utility Stationwagon	255	40	23	5	86,972	4,344	2,054	408	4.99	2.36	0.47
Overall	Utility Unknown	40	4	2	0	15,256	341	185	0	2.23	1.21	0.00
Overall	Van Minivan	983	218	100	31	310,147	30,252	7,534	1,230	9.75	2.43	0.40
Overall	Van Large	2,144	398	208	72	670,959	56,976	20,756	4,820	8.49	3.09	0.72
Overall	Van Unknown	169	18	8	3	49,610	2,188	866	134	4.41	1.75	0.27
Overall	Pickup Compact	3,924	997	466	160	1,473,597	143,448	49,659	9,047	9.73	3.37	0.61
Overall	Pickup Large	6,036	1,179	597	252	2,146,941	175,815	66,164	21,585	8.19	3.08	1.01
Overall	Pickup Unknown	173	35	17	7	59,582	6,393	2,826	321	10.73	4.74	0.54
Overall	Light Truck Other	619	110	58	24	211,907	17,929	6,838	1,850	8.46	3.23	0.87
Overall	Light Truck Unknown	116	15	8	2	31,190	1,391	645	93	4.46	2.07	0.30
Vehicle Object	All Light Vehicles	54,131	9,414	4,021	1,392	17,895,680	1,376,235	411,571	92,523	7.69	2.30	0.52
Vehicle Object	All Light Vehicles	24,654	7,004	3,552	1,386	8,704,478	1,093,243	392,405	104,746	12.56	4.51	1.20
Vehicle Object	Unknown All Light Vehicles	9,176	1,468	614	207	4,238,194	221,575	50,032	7,953	5.23	1.18	0.19
Vehicle	Car Minicompact	2,353	520	226	85	856,708	81,041	26,203	5,431	9.46	3.06	0.63
Vehicle	Car Subcompact	11,101	2,417	1,023	336	3,809,133	352,994	100,361	21,062	9.27	2.63	0.55
Vehicle	Car Compact	10,423	2,014	833	291	3,591,567	279,364	79,562	17,406	7.78	2.22	0.48
Vehicle	Car Intermediate	9,221	1,483	642	234	3,064,702	222,837	62,838	14,419	7.27	2.05	0.47
Vehicle	Car Fullsize	6,251	867	369	127	1,923,764	119,687	39,470	8,330	6.22	2.05	0.43
Vehicle	Car Largest	5,071	571	234	87	1,536,289	97,277	32,378	8,680	6.33	2.11	0.57
Vehicle	Car Unknown	492	36	19	6	174,941	5,572	2,977	1,083	3.19	1.70	0.62
Vehicle	Utility Compact	805	159	74	28	266,371	23,583	6,514	2,147	8.85	2.45	0.81
Vehicle	Utility Large	321	48	16	7	81,346	7,722	1,472	455	9.49	1.81	0.56
Vehicle	Utility Stationwagon	153	18	8	0	49,663	2,281	912	0	4.59	1.84	0.00
Vehicle	Utility Unknown	19	2	0	0	7,562	156	0	0	2.06	0.00	0.00
Vehicle	Van Minivan	609	117	56	17	170,180	15,533	2,980	667	9.13	1.75	0.39
Vehicle	Van Large	1,280	186	97	32	368,658	21,545	9,357	2,657	5.84	2.54	0.72
Vehicle	Van Unknown	90	6	3	1	25,158	770	166	109	3.06	0.66	0.43
Vehicle	Pickup Compact	2,154	441	172	58	739,813	64,831	17,727	3,122	8.76	2.40	0.42
Vehicle	Pickup Large	3,287	470	222	75	1,073,717	71,985	25,623	6,454	6.70	2.39	0.60
Vehicle	Pickup Unknown	73	11	5	1	21,880	2,902	1,023	74	13.26	4.68	0.34
Vehicle	Light Truck Other	371	43	20	6	114,688	5,524	1,801	358	4.82	1.57	0.31
Vehicle	Light Truck Unknown	57	5	2	1	19,540	632	207	67	3.24	1.06	0.34

Table 1 (continued): Driver Injury Rates in NASS Towaway Crashes

Crash Type	Vehicle Type	Investigated NASS Cases				Twelve-Year National Estimates				Injury Rates		
		Total	AIS>=2	AIS>=3	Fatal	Total	AIS>=2	AIS>=3	Fatal	AIS>=2	AIS>=3	Fatal
Object	Car Minicompact	1,034	325	167	55	321,216	46,975	19,028	4,057	14.62	5.92	1.26
Object	Car Subcompact	4,583	1,399	677	238	1,618,735	235,737	72,443	17,282	14.56	4.48	1.07
Object	Car Compact	4,178	1,270	631	226	1,450,635	198,018	72,412	17,647	13.65	4.99	1.22
Object	Car Intermediate	4,077	1,104	550	237	1,472,793	164,598	58,699	15,363	11.18	3.99	1.04
Object	Car Fullsize	2,655	654	344	135	888,715	96,171	37,221	12,005	10.82	4.19	1.35
Object	Car Largest	2,233	481	232	91	806,713	87,577	30,914	8,172	10.86	3.83	1.01
Object	Car Unknown	229	24	12	8	145,309	10,622	1,905	1,022	7.31	1.31	0.70
Object	Utility Compact	684	235	117	52	233,432	30,685	9,195	3,149	13.15	3.94	1.35
Object	Utility Large	293	85	49	27	100,049	12,659	5,300	2,121	12.65	5.30	2.12
Object	Utility Stationwagon	76	20	13	5	28,211	1,978	1,057	408	7.01	3.75	1.45
Object	Utility Unknown	11	1	1	0	6,397	175	175	0	2.74	2.74	0.00
Object	Van Minivan	224	79	38	14	84,321	9,160	2,908	563	10.86	3.45	0.67
Object	Van Large	625	181	97	36	220,759	30,404	9,768	2,070	13.77	4.42	0.94
Object	Van Unknown	35	6	2	1	12,001	1,222	581	15	10.19	4.84	0.12
Object	Pickup Compact	1,293	451	247	84	472,793	64,229	27,545	5,190	13.58	5.83	1.10
Object	Pickup Large	2,143	618	332	157	752,391	91,796	37,367	13,992	12.20	4.97	1.86
Object	Pickup Unknown	53	11	8	4	17,275	1,799	962	227	10.41	5.57	1.31
Object	Light Truck Other	201	57	33	16	65,526	9,042	4,647	1,465	13.80	7.09	2.24
Object	Light Truck Unknown	27	3	2	0	7,206	394	279	0	5.47	3.87	0.00
Unknown	Car Minicompact	285	55	17	4	121,159	5,736	1,756	277	4.73	1.45	0.23
Unknown	Car Subcompact	1,694	295	95	29	683,738	37,718	6,699	1,028	5.52	0.98	0.15
Unknown	Car Compact	1,691	277	121	41	724,760	36,892	8,844	1,276	5.09	1.22	0.18
Unknown	Car Intermediate	1,435	243	113	35	665,902	44,509	9,503	1,586	6.68	1.43	0.24
Unknown	Car Fullsize	789	105	49	21	358,225	15,871	2,980	987	4.43	0.83	0.28
Unknown	Car Largest	440	48	19	6	181,217	5,827	2,241	234	3.22	1.24	0.13
Unknown	Car Unknown	862	89	43	18	607,553	18,046	3,623	430	2.97	0.60	0.07
Unknown	Utility Compact	232	53	19	3	74,002	9,519	1,072	53	12.86	1.45	0.07
Unknown	Utility Large	70	15	9	2	23,216	4,741	872	32	20.42	3.76	0.14
Unknown	Utility Stationwagon	26	2	2	0	9,098	84	84	0	0.93	0.93	0.00
Unknown	Utility Unknown	10	1	1	0	1,297	10	10	0	0.75	0.75	0.00
Unknown	Van Minivan	150	22	6	0	55,646	5,560	1,646	0	9.99	2.96	0.00
Unknown	Van Large	239	31	14	4	81,542	5,027	1,631	92	6.17	2.00	0.11
Unknown	Van Unknown	44	6	3	1	12,451	195	119	10	1.57	0.96	0.08
Unknown	Pickup Compact	477	105	47	18	260,991	14,388	4,388	735	5.51	1.68	0.28
Unknown	Pickup Large	606	91	43	20	320,832	12,033	3,175	1,139	3.75	0.99	0.36
Unknown	Pickup Unknown	47	13	4	2	20,427	1,692	841	20	8.28	4.12	0.10
Unknown	Light Truck Other	47	10	5	2	31,693	3,363	390	27	10.61	1.23	0.09
Unknown	Light Truck Unknown	32	7	4	1	4,445	365	159	26	8.21	3.57	0.58

Table 2: Driver Injury Rates in NASS Towaway Crashes

-----DAMAGE=Rollover-----

Crash Type	Vehicle Type	Investigated NASS Cases				Twelve-Year National Estimates				Injury Rates		
		Total	AIS>=2	AIS>=3	Fatal	Total	AIS>=2	AIS>=3	Fatal	AIS>=2	AIS>=3	Fatal
Overall	All Light Vehicles	9,073	3,188	1,762	816	2,725,605	473,703	185,224	65,463	17.38	6.80	2.40
Overall	Car Minicompact	444	163	85	33	119,601	25,790	11,092	2,687	21.56	9.27	2.25
Overall	Car Subcompact	1,809	593	306	132	584,501	105,493	35,291	11,518	18.05	6.04	1.97
Overall	Car Compact	1,388	512	298	120	416,190	74,797	30,476	10,212	17.97	7.32	2.45
Overall	Car Intermediate	1,009	392	219	109	294,588	50,453	21,399	7,869	17.13	7.26	2.67
Overall	Car Fullsize	478	152	97	51	129,024	20,206	9,428	4,621	15.66	7.31	3.58
Overall	Car Largest	279	109	57	33	101,841	19,480	6,838	3,327	19.13	6.71	3.27
Overall	Car Unknown	88	14	11	5	18,814	1,205	873	536	6.40	4.64	2.85
Overall	Utility Compact	645	233	122	55	180,935	30,168	8,966	3,346	16.67	4.96	1.85
Overall	Utility Large	227	80	52	29	67,052	11,472	5,782	2,267	17.11	8.62	3.38
Overall	Utility Stationwagon	45	15	10	4	14,039	1,375	981	366	9.79	6.99	2.60
Overall	Utility Unknown	6	2	2	0	2,384	185	185	0	7.76	7.76	0.00
Overall	Van Minivan	139	51	28	11	35,919	6,685	2,847	455	18.61	7.93	1.27
Overall	Van Large	335	111	61	30	108,200	19,898	4,481	1,786	18.39	4.14	1.65
Overall	Van Unknown	38	6	2	1	10,531	1,261	576	10	11.97	5.47	0.09
Overall	Pickup Compact	901	334	178	77	289,665	45,517	19,791	4,692	15.71	6.83	1.62
Overall	Pickup Large	1,118	382	209	112	322,097	54,271	23,059	10,640	16.85	7.16	3.30
Overall	Pickup Unknown	29	9	6	4	7,948	1,391	687	207	17.50	8.64	2.61
Overall	Light Truck Other	79	25	16	10	19,471	3,623	2,217	925	18.61	11.38	4.75
Overall	Light Truck Unknown	16	5	3	0	2,805	436	256	0	15.53	9.12	0.00
Vehicle Object	All Light Vehicles	1,079	417	233	99	193,172	51,703	20,442	7,616	26.77	10.58	3.94
Unknown	All Light Vehicles	7,250	2,531	1,397	661	2,276,555	390,430	155,261	55,763	17.15	6.82	2.45
Unknown	All Light Vehicles	744	240	132	56	255,878	31,570	9,522	2,085	12.34	3.72	0.81
Vehicle	Car Minicompact	44	19	10	5	6,637	2,662	715	414	40.10	10.77	6.24
Vehicle	Car Subcompact	190	90	54	23	40,238	18,034	6,144	2,745	44.82	15.27	6.82
Vehicle	Car Compact	132	62	38	14	19,358	7,470	3,341	1,093	38.59	17.26	5.65
Vehicle	Car Intermediate	83	36	26	12	16,638	2,541	1,794	590	15.27	10.78	3.55
Vehicle	Car Fullsize	48	14	10	9	6,305	800	516	414	12.68	8.19	6.57
Vehicle	Car Largest	23	7	3	0	3,301	1,422	501	0	43.06	15.18	0.00
Vehicle	Car Unknown	5	1	1	0	1,489	13	13	0	0.89	0.89	0.00
Vehicle	Utility Compact	99	33	16	5	15,982	2,370	795	249	14.83	4.98	1.56
Vehicle	Utility Large	22	10	6	3	3,610	955	548	279	26.45	15.17	7.72
Vehicle	Utility Stationwagon	7	2	0	0	1,142	125	0	0	10.95	0.00	0.00
Vehicle	Utility Unknown	1	0	0	0	71	0	0	0	0.00	0.00	0.00
Vehicle	Van Minivan	40	17	10	4	7,843	2,404	526	196	30.64	6.71	2.50
Vehicle	Van Large	80	27	19	8	14,676	2,999	2,038	835	20.44	13.89	5.69
Vehicle	Van Unknown	9	2	0	0	1,463	441	0	0	30.11	0.00	0.00
Vehicle	Pickup Compact	129	40	15	7	24,940	2,889	1,099	327	11.58	4.41	1.31
Vehicle	Pickup Large	148	53	23	8	24,381	6,253	2,298	399	25.65	9.43	1.64
Vehicle	Pickup Unknown	5	1	1	1	1,538	74	74	74	4.83	4.83	4.83
Vehicle	Light Truck Other	14	3	1	0	3,559	254	39	0	7.14	1.10	0.00

Table 2 (continued): Driver Injury Rates in NASS Towaway Crashes

-----DAMAGE=Rollover-----

Crash Type	Vehicle Type	Investigated NASS Cases				Twelve-Year National Estimates				Injury Rates		
		Total	AIS>=2	AIS>=3	Fatal	Total	AIS>=2	AIS>=3	Fatal	AIS>=2	AIS>=3	Fatal
Object	Car Minicompact	380	139	72	27	106,703	22,417	10,013	2,264	21.01	9.38	2.12
Object	Car Subcompact	1,508	469	239	104	506,547	82,558	28,586	8,552	16.30	5.64	1.69
Object	Car Compact	1,158	415	236	98	363,780	63,203	25,790	8,990	17.37	7.09	2.47
Object	Car Intermediate	855	333	180	89	262,301	45,601	18,780	7,002	17.39	7.16	2.67
Object	Car Fullsize	403	128	81	37	114,598	18,854	8,723	4,031	16.45	7.61	3.52
Object	Car Largest	243	100	53	32	82,462	17,860	6,251	3,241	21.66	7.58	3.93
Object	Car Unknown	36	6	5	3	8,881	874	762	501	9.84	8.58	5.64
Object	Utility Compact	480	177	96	48	150,729	24,684	7,604	3,062	16.38	5.04	2.03
Object	Utility Large	180	62	39	24	53,674	8,604	4,517	1,957	16.03	8.42	3.65
Object	Utility Stationwagon	35	12	9	4	12,741	1,175	907	366	9.22	7.12	2.87
Object	Utility Unknown	4	1	1	0	2,303	175	175	0	7.61	7.61	0.00
Object	Van Minivan	84	30	15	7	24,277	3,167	1,277	259	13.05	5.26	1.07
Object	Van Large	228	80	40	21	86,128	16,220	2,429	942	18.83	2.82	1.09
Object	Van Unknown	18	3	1	0	5,815	810	566	0	13.93	9.73	0.00
Object	Pickup Compact	674	253	145	61	220,126	36,350	16,889	4,120	16.51	7.67	1.87
Object	Pickup Large	876	295	165	94	253,394	43,586	19,047	9,428	17.20	7.52	3.72
Object	Pickup Unknown	17	5	4	2	4,842	950	602	123	19.62	12.44	2.55
Object	Light Truck Other	62	21	15	10	15,318	3,063	2,178	925	20.00	14.22	6.04
Object	Light Truck Unknown	9	2	1	0	1,934	279	163	0	14.40	8.42	0.00
Unknown	Car Minicompact	20	5	3	1	6,261	712	364	9	11.37	5.82	0.14
Unknown	Car Subcompact	111	34	13	5	37,716	4,901	561	222	12.99	1.49	0.59
Unknown	Car Compact	98	35	24	8	33,051	4,125	1,344	129	12.48	4.07	0.39
Unknown	Car Intermediate	71	23	13	8	15,649	2,310	825	277	14.76	5.27	1.77
Unknown	Car Fullsize	27	10	6	5	8,120	552	189	176	6.80	2.33	2.16
Unknown	Car Largest	13	2	1	1	16,078	199	85	85	1.24	0.53	0.53
Unknown	Car Unknown	47	7	5	2	8,444	317	98	34	3.76	1.16	0.41
Unknown	Utility Compact	66	23	10	2	14,224	3,114	567	35	21.89	3.99	0.25
Unknown	Utility Large	25	8	7	2	9,769	1,912	717	32	19.58	7.34	0.33
Unknown	Utility Stationwagon	3	1	1	0	156	75	75	0	47.90	47.90	0.00
Unknown	Utility Unknown	1	1	1	0	10	10	10	0	100.00	100.00	0.00
Unknown	Van Minivan	15	4	3	0	3,799	1,114	1,044	0	29.33	27.49	0.00
Unknown	Van Large	27	4	2	1	7,396	680	13	10	9.19	0.18	0.13
Unknown	Van Unknown	11	1	1	1	3,253	10	10	10	0.30	0.30	0.30
Unknown	Pickup Compact	98	41	18	9	44,600	6,279	1,803	245	14.08	4.04	0.55
Unknown	Pickup Large	94	34	21	10	44,322	4,432	1,714	813	10.00	3.87	1.83
Unknown	Pickup Unknown	7	3	1	1	1,567	367	10	10	23.40	0.62	0.62
Unknown	Light Truck Other	3	1	0	0	594	306	0	0	51.47	0.00	0.00
Unknown	Light Truck Unknown	7	3	2	0	871	157	93	0	18.03	10.67	0.00

Table 3: Driver Injury Rates in NASS Towaway Crashes

-----DAMAGE=Front-----

Crash Type	Vehicle Type	Investigated NASS Cases				Twelve-Year National Estimates				Injury Rates		
		Total	AIS>=2	AIS>=3	Fatal	Total	AIS>=2	AIS>=3	Fatal	AIS>=2	AIS>=3	Fatal
Overall	All Light Vehicles	34,802	7,778	3,379	1,050	11,199,819	1,145,246	355,280	68,813	10.23	3.17	0.61
Overall	Car Minicompact	1,551	414	185	62	534,316	60,172	19,640	3,021	11.26	3.68	0.57
Overall	Car Subcompact	7,070	1,877	776	216	2,339,835	283,010	75,774	13,602	12.10	3.24	0.58
Overall	Car Compact	6,551	1,625	656	197	2,163,288	241,968	70,026	11,584	11.19	3.24	0.54
Overall	Car Intermediate	5,816	1,175	512	183	1,924,326	180,651	53,254	12,197	9.39	2.77	0.63
Overall	Car Fullsize	3,970	738	338	116	1,179,232	98,412	35,198	8,217	8.35	2.98	0.70
Overall	Car Largest	3,350	530	238	76	1,065,214	88,221	32,428	6,612	8.28	3.04	0.62
Overall	Car Unknown	43	5	2	1	10,301	283	101	92	2.74	0.98	0.89
Overall	Utility Compact	516	114	45	12	187,288	14,512	5,013	771	7.75	2.68	0.41
Overall	Utility Large	226	33	9	1	61,890	5,367	770	76	8.67	1.24	0.12
Overall	Utility Stationwagon	108	16	9	0	30,678	1,858	994	0	6.06	3.24	0.00
Overall	Utility Unknown	12	1	0	0	4,768	31	0	0	0.64	0.00	0.00
Overall	Van Minivan	385	102	51	12	101,860	12,300	3,074	281	12.08	3.02	0.28
Overall	Van Large	826	188	105	30	217,214	21,523	10,098	2,345	9.91	4.65	1.08
Overall	Van Unknown	42	4	3	2	11,276	212	136	124	1.88	1.20	1.10
Overall	Pickup Compact	1,575	411	185	55	499,408	53,948	20,128	3,003	10.80	4.03	0.60
Overall	Pickup Large	2,472	486	238	82	782,304	71,770	24,981	6,591	9.17	3.19	0.84
Overall	Pickup Unknown	40	11	5	1	12,945	3,001	951	58	23.18	7.35	0.45
Overall	Light Truck Other	249	48	22	4	73,676	8,008	2,715	239	10.87	3.69	0.32
Vehicle Object	All Light Vehicles	24,613	4,826	2,008	656	7,754,303	685,048	201,597	43,626	8.83	2.60	0.56
Unknown	All Light Vehicles	10,179	2,950	1,369	394	3,438,101	460,002	153,487	25,187	13.38	4.46	0.73
Unknown	All Light Vehicles	10	2	2	0	7,415	196	196	0	2.64	2.64	0.00
Vehicle	Car Minicompact	1,141	283	121	45	407,105	43,229	13,626	2,349	10.62	3.35	0.58
Vehicle	Car Subcompact	5,143	1,220	479	149	1,733,420	177,429	44,622	9,316	10.24	2.57	0.54
Vehicle	Car Compact	4,785	1,075	411	134	1,555,158	146,363	37,982	7,425	9.41	2.44	0.48
Vehicle	Car Intermediate	4,014	708	305	101	1,295,809	106,321	30,168	6,973	8.20	2.33	0.54
Vehicle	Car Fullsize	2,734	415	182	57	778,606	53,507	19,090	4,062	6.87	2.45	0.52
Vehicle	Car Largest	2,212	289	126	46	661,632	46,309	16,661	4,590	7.00	2.52	0.69
Vehicle	Car Unknown	30	3	1	1	8,629	152	92	92	1.76	1.07	1.07
Vehicle	Utility Compact	377	73	31	11	128,778	10,896	3,779	761	8.46	2.93	0.59
Vehicle	Utility Large	155	19	3	1	32,479	2,850	167	76	8.77	0.51	0.24
Vehicle	Utility Stationwagon	86	12	7	0	21,024	1,567	893	0	7.45	4.25	0.00
Vehicle	Utility Unknown	8	1	0	0	2,517	31	0	0	1.22	0.00	0.00
Vehicle	Van Minivan	291	65	34	8	71,232	7,806	1,775	207	10.96	2.49	0.29
Vehicle	Van Large	569	109	60	18	138,795	11,419	5,600	1,332	8.23	4.03	0.96
Vehicle	Van Unknown	33	2	2	1	8,277	121	121	109	1.46	1.46	1.32
Vehicle	Pickup Compact	1,164	259	105	37	377,453	31,889	11,174	2,101	8.45	2.96	0.56
Vehicle	Pickup Large	1,680	263	128	45	479,273	39,262	13,972	4,100	8.19	2.92	0.86
Vehicle	Pickup Unknown	23	7	3	0	6,568	2,358	798	0	35.91	12.15	0.00
Vehicle	Light Truck Other	168	23	10	2	47,547	3,539	1,078	133	7.44	2.27	0.28

Table 3 (continued): Driver Injury Rates in NASS Towaway Crashes

-----DAMAGE=Front-----

Crash Type	Vehicle Type	Investigated NASS Cases				Twelve-Year National Estimates				Injury Rates		
		Total	AIS>=2	AIS>=3	Fatal	Total	AIS>=2	AIS>=3	Fatal	AIS>=2	AIS>=3	Fatal
Object	Car Minicompact	409	131	64	17	126,941	16,943	6,015	672	13.35	4.74	0.53
Object	Car Subcompact	1,924	656	296	67	604,914	105,504	31,075	4,286	17.44	5.14	0.71
Object	Car Compact	1,766	550	245	63	608,130	95,605	32,044	4,159	15.72	5.27	0.68
Object	Car Intermediate	1,801	467	207	82	626,965	74,330	23,086	5,224	11.86	3.68	0.83
Object	Car Fullsize	1,236	323	156	59	400,626	44,904	16,107	4,155	11.21	4.02	1.04
Object	Car Largest	1,136	241	112	30	400,339	41,912	15,767	2,022	10.47	3.94	0.51
Object	Car Unknown	13	2	1	0	1,672	131	9	0	7.84	0.53	0.00
Object	Utility Compact	139	41	14	1	58,511	3,617	1,234	10	6.18	2.11	0.02
Object	Utility Large	71	14	6	0	29,411	2,518	603	0	8.56	2.05	0.00
Object	Utility Stationwagon	22	4	2	0	9,654	291	101	0	3.01	1.05	0.00
Object	Utility Unknown	4	0	0	0	2,251	0	0	0	0.00	0.00	0.00
Object	Van Minivan	94	37	17	4	30,627	4,494	1,300	74	14.67	4.24	0.24
Object	Van Large	257	79	45	12	78,419	10,103	4,498	1,013	12.88	5.74	1.29
Object	Van Unknown	9	2	1	1	2,999	91	15	15	3.04	0.50	0.50
Object	Pickup Compact	409	151	79	18	121,802	21,940	8,835	903	18.01	7.25	0.74
Object	Pickup Large	791	223	110	37	302,333	32,508	11,010	2,491	10.75	3.64	0.82
Object	Pickup Unknown	17	4	2	1	6,377	643	153	58	10.08	2.40	0.91
Object	Light Truck Other	81	25	12	2	26,129	4,468	1,637	105	17.10	6.26	0.40
Unknown	Car Minicompact	1	0	0	0	269	0	0	0	0.00	0.00	0.00
Unknown	Car Subcompact	3	1	1	0	1,501	77	77	0	5.11	5.11	0.00
Unknown	Car Intermediate	1	0	0	0	1,552	0	0	0	0.00	0.00	0.00
Unknown	Car Largest	2	0	0	0	3,243	0	0	0	0.00	0.00	0.00
Unknown	Pickup Compact	2	1	1	0	153	119	119	0	77.93	77.93	0.00
Unknown	Pickup Large	1	0	0	0	698	0	0	0	0.00	0.00	0.00

Table 4: Driver Injury Rates in NASS Towaway Crashes

-----DAMAGE=Side-----

Crash Type	Vehicle Type	Investigated NASS Cases				Twelve-Year National Estimates				Injury Rates		
		Total	AIS>=2	AIS>=3	Fatal	Total	AIS>=2	AIS>=3	Fatal	AIS>=2	AIS>=3	Fatal
Overall	All Light Vehicles	15,692	3,855	1,887	719	5,323,772	578,233	196,622	47,598	10.86	3.69	0.89
Overall	Car Minicompact	618	186	95	36	231,067	26,700	10,703	3,037	11.56	4.63	1.31
Overall	Car Subcompact	3,453	992	496	185	1,161,922	140,291	46,338	10,032	12.07	3.99	0.86
Overall	Car Compact	3,273	848	407	159	1,130,184	116,191	40,273	10,930	10.28	3.56	0.97
Overall	Car Intermediate	2,989	720	367	143	1,000,659	107,149	37,919	7,820	10.71	3.79	0.78
Overall	Car Fullsize	1,970	425	199	69	653,399	64,625	23,830	5,961	9.89	3.65	0.91
Overall	Car Largest	1,509	248	114	54	482,050	46,410	15,770	5,221	9.63	3.27	1.08
Overall	Car Unknown	29	6	3	0	7,824	1,532	899	0	19.58	11.49	0.00
Overall	Utility Compact	150	43	23	10	49,293	9,093	1,526	800	18.45	3.10	1.62
Overall	Utility Large	66	20	8	5	19,430	4,672	739	197	24.05	3.80	1.01
Overall	Utility Stationwagon	28	5	2	1	13,728	619	50	42	4.51	0.36	0.31
Overall	Utility Unknown	4	0	0	0	1,569	0	0	0	0.00	0.00	0.00
Overall	Van Minivan	155	32	12	6	50,017	3,994	516	223	7.99	1.03	0.45
Overall	Van Large	220	39	16	4	55,494	5,155	1,363	184	9.29	2.46	0.33
Overall	Van Unknown	11	2	1	0	4,930	366	45	0	7.42	0.91	0.00
Overall	Pickup Compact	469	130	55	10	191,398	23,529	5,166	566	12.29	2.70	0.30
Overall	Pickup Large	644	139	78	30	235,436	25,851	10,435	1,992	10.98	4.43	0.85
Overall	Pickup Unknown	14	2	1	0	5,534	326	161	0	5.89	2.90	0.00
Overall	Light Truck Other	90	18	10	7	29,838	1,731	889	593	5.80	2.98	1.99
Vehicle Object	All Light Vehicles	12,978	2,961	1,360	496	4,298,080	443,317	142,142	30,964	10.31	3.31	0.72
Unknown	All Light Vehicles	2,712	894	527	223	1,025,521	134,916	54,480	16,634	13.16	5.31	1.62
	All Light Vehicles	2	0	0	0	171	0	0	0	0.00	0.00	0.00
Vehicle	Car Minicompact	523	151	73	28	203,214	22,355	8,807	2,247	11.00	4.33	1.11
Vehicle	Car Subcompact	2,943	819	394	138	952,959	110,116	37,434	7,435	11.56	3.93	0.78
Vehicle	Car Compact	2,701	649	297	114	923,635	90,895	28,975	7,274	9.84	3.14	0.79
Vehicle	Car Intermediate	2,414	532	249	97	789,049	79,137	25,444	5,675	10.03	3.22	0.72
Vehicle	Car Fullsize	1,575	313	136	46	501,014	47,649	16,175	2,924	9.51	3.23	0.58
Vehicle	Car Largest	1,260	171	69	29	389,805	32,548	9,996	2,549	8.35	2.56	0.65
Vehicle	Car Unknown	25	5	3	0	6,449	1,236	899	0	19.16	13.94	0.00
Vehicle	Utility Compact	128	34	18	9	43,012	7,760	1,227	782	18.04	2.85	1.82
Vehicle	Utility Large	49	13	5	2	12,561	3,290	575	32	26.19	4.58	0.26
Vehicle	Utility Stationwagon	22	3	0	0	12,490	570	0	0	4.56	0.00	0.00
Vehicle	Utility Unknown	3	0	0	0	1,293	0	0	0	0.00	0.00	0.00
Vehicle	Van Minivan	140	25	9	4	44,804	2,974	392	110	6.64	0.87	0.25
Vehicle	Van Large	192	30	11	2	51,052	4,123	1,021	75	8.08	2.00	0.15
Vehicle	Van Unknown	9	1	1	0	4,253	45	45	0	1.06	1.06	0.00
Vehicle	Pickup Compact	382	102	39	7	137,602	20,297	3,990	460	14.75	2.90	0.33
Vehicle	Pickup Large	530	100	50	16	199,550	19,077	6,718	1,175	9.56	3.37	0.59
Vehicle	Pickup Unknown	10	1	0	0	3,921	165	0	0	4.22	0.00	0.00
Vehicle Object	Light Truck Other	72	12	6	4	21,416	1,080	444	225	5.04	2.07	1.05
Object	Car Minicompact	95	35	22	8	27,854	4,345	1,896	790	15.60	6.81	2.84

Table 4 (continued): Driver Injury Rates in NASS Towaway Crashes

-----DAMAGE=Side-----

Crash Type	Vehicle Type	Investigated NASS Cases				Twelve-Year National Estimates				Injury Rates		
		Total	AIS>=2	AIS>=3	Fatal	Total	AIS>=2	AIS>=3	Fatal	AIS>=2	AIS>=3	Fatal
Object	Car Subcompact	509	173	102	47	208,847	30,175	8,903	2,597	14.45	4.26	1.24
Object	Car Compact	572	199	110	45	206,549	25,296	11,298	3,657	12.25	5.47	1.77
Object	Car Intermediate	575	188	118	46	211,610	28,012	12,476	2,144	13.24	5.90	1.01
Object	Car Fullsize	394	112	63	23	152,329	16,977	7,655	3,036	11.14	5.03	1.99
Object	Car Largest	249	77	45	25	92,244	13,861	5,774	2,672	15.03	6.26	2.90
Object	Car Unknown	4	1	0	0	1,375	296	0	0	21.53	0.00	0.00
Object	Utility Compact	22	9	5	1	6,281	1,332	298	19	21.21	4.75	0.30
Object	Utility Large	17	7	3	3	6,869	1,382	164	164	20.13	2.39	2.39
Object	Utility Stationwagon	6	2	2	1	1,239	50	50	42	4.01	4.01	3.41
Object	Utility Unknown	1	0	0	0	275	0	0	0	0.00	0.00	0.00
Object	Van Minivan	15	7	3	2	5,213	1,020	125	113	19.57	2.39	2.17
Object	Van Large	28	9	5	2	4,442	1,032	342	108	23.22	7.70	2.44
Object	Van Unknown	2	1	0	0	677	321	0	0	47.38	0.00	0.00
Object	Pickup Compact	87	28	16	3	53,796	3,232	1,177	106	6.01	2.19	0.20
Object	Pickup Large	114	39	28	14	35,887	6,774	3,717	817	18.87	10.36	2.28
Object	Pickup Unknown	4	1	1	0	1,613	161	161	0	9.96	9.96	0.00
Object	Light Truck Other	18	6	4	3	8,422	651	445	369	7.73	5.28	4.38
Unknown	Car Subcompact	1	0	0	0	116	0	0	0	0.00	0.00	0.00
Unknown	Car Fullsize	1	0	0	0	55	0	0	0	0.00	0.00	0.00

Table 5: Driver Injury Rates in NASS Towaway Crashes

-----DAMAGE=Back-----

Crash Type	Vehicle Type	Investigated NASS Cases				Twelve-Year National Estimates				Injury Rates		
		Total	AIS>=2	AIS>=3	Fatal	Total	AIS>=2	AIS>=3	Fatal	AIS>=2	AIS>=3	Fatal
Overall	All Light Vehicles	3,788	350	111	44	1,513,807	64,374	12,696	2,580	4.25	0.84	0.17
Overall	Car Minicompact	207	26	10	5	74,109	4,868	712	220	6.57	0.96	0.30
Overall	Car Subcompact	942	100	34	13	405,496	18,321	4,772	845	4.52	1.18	0.21
Overall	Car Compact	830	68	22	7	390,765	11,746	2,753	186	3.01	0.70	0.05
Overall	Car Intermediate	676	56	17	8	270,090	11,051	2,282	533	4.09	0.84	0.20
Overall	Car Fullsize	426	34	7	3	139,715	5,872	309	52	4.20	0.22	0.04
Overall	Car Largest	320	20	8	3	100,635	2,304	940	577	2.29	0.93	0.57
Overall	Car Unknown	3	1	1	1	715	10	10	10	1.46	1.46	1.46
Overall	Utility Compact	50	8	3	0	21,805	1,568	118	0	7.19	0.54	0.00
Overall	Utility Large	10	1	0	0	2,023	102	0	0	5.04	0.00	0.00
Overall	Utility Stationwagon	9	1	0	0	2,576	292	0	0	11.35	0.00	0.00
Overall	Utility Unknown	2	1	0	0	325	125	0	0	38.56	0.00	0.00
Overall	Van Minivan	34	2	1	0	8,952	131	45	0	1.47	0.51	0.00
Overall	Van Large	46	5	1	1	10,740	681	67	67	6.34	0.63	0.63
Overall	Van Unknown	6	1	0	0	926	164	0	0	17.68	0.00	0.00
Overall	Pickup Compact	89	15	4	2	36,083	5,866	495	28	16.26	1.37	0.08
Overall	Pickup Large	117	10	2	1	42,783	1,243	161	61	2.90	0.38	0.14
Overall	Pickup Unknown	2	0	0	0	368	0	0	0	0.00	0.00	0.00
Overall	Light Truck Other	19	1	1	0	5,701	29	29	0	0.51	0.51	0.00
Vehicle Object Unknown	All Light Vehicles	3,550	305	96	36	1,406,998	55,583	11,190	1,880	3.95	0.80	0.13
	All Light Vehicles	237	45	15	8	106,592	8,791	1,506	700	8.25	1.41	0.66
	All Light Vehicles	1	0	0	0	218	0	0	0	0.00	0.00	0.00
Vehicle	Car Minicompact	196	24	9	4	69,736	4,606	610	118	6.60	0.87	0.17
Vehicle	Car Subcompact	887	88	31	11	373,055	15,069	4,527	613	4.04	1.21	0.16
Vehicle	Car Compact	784	61	20	6	372,474	10,867	2,706	165	2.92	0.73	0.04
Vehicle	Car Intermediate	624	44	11	5	248,370	8,719	1,231	200	3.51	0.50	0.08
Vehicle	Car Fullsize	392	28	6	3	127,661	4,862	292	52	3.81	0.23	0.04
Vehicle	Car Largest	296	19	7	3	87,234	2,272	908	577	2.60	1.04	0.66
Vehicle	Car Unknown	2	0	0	0	704	0	0	0	0.00	0.00	0.00
Vehicle	Utility Compact	50	8	3	0	21,805	1,568	118	0	7.19	0.54	0.00
Vehicle	Utility Large	9	1	0	0	1,686	102	0	0	6.05	0.00	0.00
Vehicle	Utility Stationwagon	8	0	0	0	2,283	0	0	0	0.00	0.00	0.00
Vehicle	Utility Unknown	2	1	0	0	325	125	0	0	38.56	0.00	0.00
Vehicle	Van Minivan	33	2	1	0	8,807	131	45	0	1.49	0.51	0.00
Vehicle	Van Large	46	5	1	1	10,740	681	67	67	6.34	0.63	0.63
Vehicle	Van Unknown	6	1	0	0	926	164	0	0	17.68	0.00	0.00
Vehicle	Pickup Compact	87	14	4	2	35,987	5,809	495	28	16.14	1.38	0.08
Vehicle	Pickup Large	110	8	2	1	40,272	579	161	61	1.44	0.40	0.15
Vehicle	Pickup Unknown	2	0	0	0	368	0	0	0	0.00	0.00	0.00
Vehicle	Light Truck Other	16	1	1	0	4,564	29	29	0	0.63	0.63	0.00

Table 5 (continued): Driver Injury Rates in NASS Towaway Crashes

-----DAMAGE=Back-----

Crash Type	Vehicle Type	Investigated NASS Cases				Twelve-Year National Estimates				Injury Rates		
		Total	AIS>=2	AIS>=3	Fatal	Total	AIS>=2	AIS>=3	Fatal	AIS>=2	AIS>=3	Fatal
Object	Car Minicompact	11	2	1	1	4,372	263	103	103	6.01	2.35	2.35
Object	Car Subcompact	55	12	3	2	32,440	3,252	246	232	10.02	0.76	0.72
Object	Car Compact	46	7	2	1	18,291	879	47	21	4.81	0.26	0.12
Object	Car Intermediate	51	12	6	3	21,502	2,332	1,051	333	10.85	4.89	1.55
Object	Car Fullsize	34	6	1	0	12,054	1,010	18	0	8.38	0.15	0.00
Object	Car Largest	24	1	1	0	13,402	32	32	0	0.24	0.24	0.00
Object	Car Unknown	1	1	1	1	10	10	10	10	100.00	100.00	100.00
Object	Utility Large	1	0	0	0	338	0	0	0	0.00	0.00	0.00
Object	Utility Stationwagon	1	1	0	0	292	292	0	0	100.00	0.00	0.00
Object	Van Minivan	1	0	0	0	145	0	0	0	0.00	0.00	0.00
Object	Pickup Compact	2	1	0	0	96	57	0	0	59.46	0.00	0.00
Object	Pickup Large	7	2	0	0	2,511	664	0	0	26.43	0.00	0.00
Object	Light Truck Other	3	0	0	0	1,137	0	0	0	0.00	0.00	0.00
Unknown	Car Intermediate	1	0	0	0	218	0	0	0	0.00	0.00	0.00

Table 6: Driver Injury Rates in NASS Towaway Crashes

----- DAMAGE=Other -----

Crash Type	Vehicle Type	Investigated NASS Cases				Twelve-Year National Estimates				Injury Rates		
		Total	AIS>=2	AIS>=3	Fatal	Total	AIS>=2	AIS>=3	Fatal	AIS>=2	AIS>=3	Fatal
Overall	All Light Vehicles	468	73	30	13	206,497	14,885	4,390	1,852	7.21	2.13	0.90
Overall	Car Minicompact	19	3	1	0	6,462	235	113	0	3.63	1.75	0.00
Overall	Car Subcompact	84	21	8	3	42,109	5,327	1,367	559	12.65	3.25	1.33
Overall	Car Compact	85	11	4	1	39,579	2,035	813	86	5.14	2.06	0.22
Overall	Car Intermediate	91	12	4	2	39,095	1,532	357	101	3.92	0.91	0.26
Overall	Car Fullsize	66	9	5	1	25,284	1,466	596	168	5.80	2.36	0.67
Overall	Car Largest	63	9	2	1	27,889	2,913	205	44	10.45	0.73	0.16
Overall	Car Unknown	1	0	0	0	91	0	0	0	0.00	0.00	0.00
Overall	Utility Compact	5	2	1	1	1,751	451	30	30	25.74	1.74	1.74
Overall	Utility Large	3	0	0	0	1,070	0	0	0	0.00	0.00	0.00
Overall	Van Minivan	4	0	0	0	9,304	0	0	0	0.00	0.00	0.00
Overall	Van Large	8	0	0	0	1,636	0	0	0	0.00	0.00	0.00
Overall	Pickup Compact	10	0	0	0	3,958	0	0	0	0.00	0.00	0.00
Overall	Pickup Large	26	6	5	4	7,667	927	908	864	12.09	11.84	11.26
Overall	Light Truck Other	3	0	0	0	601	0	0	0	0.00	0.00	0.00
Vehicle Object	All Light Vehicles	26	5	4	3	2,563	329	286	279	12.84	11.16	10.89
Vehicle Object	All Light Vehicles	442	68	26	10	203,935	14,556	4,104	1,573	7.14	2.01	0.77
Vehicle Object	Car Minicompact	1	0	0	0	160	0	0	0	0.00	0.00	0.00
Vehicle Object	Car Subcompact	7	3	2	1	581	80	37	30	13.81	6.41	5.24
Vehicle Object	Car Compact	4	0	0	0	578	0	0	0	0.00	0.00	0.00
Vehicle Object	Car Intermediate	5	0	0	0	252	0	0	0	0.00	0.00	0.00
Vehicle Object	Car Fullsize	3	0	0	0	164	0	0	0	0.00	0.00	0.00
Vehicle Object	Car Largest	2	1	1	1	172	44	44	44	25.36	25.36	25.36
Vehicle Object	Utility Large	1	0	0	0	114	0	0	0	0.00	0.00	0.00
Vehicle Object	Van Large	1	0	0	0	75	0	0	0	0.00	0.00	0.00
Vehicle Object	Pickup Large	2	1	1	1	466	205	205	205	43.95	43.95	43.95
Object	Car Minicompact	18	3	1	0	6,302	235	113	0	3.73	1.79	0.00
Object	Car Subcompact	77	18	6	2	41,528	5,247	1,329	529	12.63	3.20	1.27
Object	Car Compact	81	11	4	1	39,001	2,035	813	86	5.22	2.09	0.22
Object	Car Intermediate	86	12	4	2	38,842	1,532	357	101	3.94	0.92	0.26
Object	Car Fullsize	63	9	5	1	25,120	1,466	596	168	5.83	2.37	0.67
Object	Car Largest	61	8	1	0	27,717	2,870	161	0	10.35	0.58	0.00
Object	Car Unknown	1	0	0	0	91	0	0	0	0.00	0.00	0.00
Object	Utility Compact	5	2	1	1	1,751	451	30	30	25.74	1.74	1.74
Object	Utility Large	2	0	0	0	956	0	0	0	0.00	0.00	0.00
Object	Van Minivan	4	0	0	0	9,304	0	0	0	0.00	0.00	0.00
Object	Van Large	7	0	0	0	1,560	0	0	0	0.00	0.00	0.00
Object	Pickup Compact	10	0	0	0	3,958	0	0	0	0.00	0.00	0.00
Object	Pickup Large	24	5	4	3	7,201	722	703	659	10.03	9.77	9.15
Object	Light Truck Other	3	0	0	0	601	0	0	0	0.00	0.00	0.00

Table 7: Driver Injury Rates in NASS Towaway Crashes

-----DAMAGE=Unknown area-----

Crash Type	Vehicle Type	Investigated NASS Cases				Twelve-Year National Estimates				Injury Rates		
		Total	AIS>=2	AIS>=3	Fatal	Total	AIS>=2	AIS>=3	Fatal	AIS>=2	AIS>=3	Fatal
Overall	All Light Vehicles	24,021	2,635	1,018	343	9,470,057	400,910	99,795	18,915	4.23	1.05	0.20
Overall	Car Minicompact	833	108	34	8	333,528	15,986	4,725	799	4.79	1.42	0.24
Overall	Car Subcompact	4,020	528	175	54	1,577,743	74,008	15,962	2,815	4.69	1.01	0.18
Overall	Car Compact	4,165	497	198	74	1,626,956	67,537	16,476	3,331	4.15	1.01	0.20
Overall	Car Intermediate	4,152	475	186	61	1,674,639	81,108	15,828	2,848	4.84	0.95	0.17
Overall	Car Fullsize	2,785	268	116	43	1,044,050	41,148	10,310	2,305	3.94	0.99	0.22
Overall	Car Largest	2,223	184	66	17	746,590	31,353	9,352	1,306	4.20	1.25	0.17
Overall	Car Unknown	1,321	118	57	25	557,729	21,411	6,622	1,897	3.84	1.19	0.34
Overall	Utility Compact	355	47	16	5	132,733	7,997	1,127	402	6.02	0.85	0.30
Overall	Utility Large	152	14	5	1	53,147	3,509	354	67	6.60	0.67	0.13
Overall	Utility Stationwagon	65	3	2	0	25,950	200	30	0	0.77	0.11	0.00
Overall	Utility Unknown	16	0	0	0	6,210	0	0	0	0.00	0.00	0.00
Overall	Van Minivan	265	31	8	2	96,925	7,142	1,051	270	7.37	1.08	0.28
Overall	Van Large	705	55	25	7	270,252	9,719	4,746	438	3.60	1.76	0.16
Overall	Van Unknown	72	5	2	0	21,947	186	109	0	0.85	0.50	0.00
Overall	Pickup Compact	877	107	44	16	441,635	14,587	4,079	758	3.30	0.92	0.17
Overall	Pickup Large	1,651	155	65	23	726,780	20,236	6,620	1,437	2.78	0.91	0.20
Overall	Pickup Unknown	87	13	5	2	32,572	1,675	1,028	55	5.14	3.15	0.17
Overall	Light Truck Other	177	17	9	3	72,288	2,153	989	93	2.98	1.37	0.13
Overall	Light Truck Unknown	100	10	5	2	28,385	956	389	93	3.37	1.37	0.33
Vehicle Object Unknown	All Light Vehicles	11,884	900	320	102	4,240,348	140,255	35,914	8,158	3.31	0.85	0.19
Vehicle Object Unknown	All Light Vehicles	3,834	516	218	90	1,653,775	84,547	23,567	4,889	5.11	1.43	0.30
Vehicle Object Unknown	All Light Vehicles	8,303	1,219	480	151	3,575,934	176,108	40,315	5,868	4.92	1.13	0.16
Vehicle	Car Minicompact	448	43	13	3	169,856	8,189	2,445	303	4.82	1.44	0.18
Vehicle	Car Subcompact	1,931	197	63	14	708,880	32,266	7,597	923	4.55	1.07	0.13
Vehicle	Car Compact	2,017	167	67	23	720,364	23,768	6,558	1,450	3.30	0.91	0.20
Vehicle	Car Intermediate	2,081	163	51	19	714,584	26,119	4,201	980	3.66	0.59	0.14
Vehicle	Car Fullsize	1,499	97	35	12	510,014	12,869	3,397	879	2.52	0.67	0.17
Vehicle	Car Largest	1,278	84	28	8	394,145	14,682	4,267	920	3.73	1.08	0.23
Vehicle	Car Unknown	430	27	14	5	157,669	4,171	1,973	991	2.65	1.25	0.63
Vehicle	Utility Compact	151	11	6	3	56,795	990	594	355	1.74	1.05	0.63
Vehicle	Utility Large	85	5	2	1	30,897	526	183	67	1.70	0.59	0.22
Vehicle	Utility Stationwagon	30	1	1	0	12,724	20	20	0	0.16	0.16	0.00
Vehicle	Utility Unknown	5	0	0	0	3,356	0	0	0	0.00	0.00	0.00
Vehicle	Van Minivan	105	8	2	1	37,493	2,217	242	154	5.91	0.65	0.41
Vehicle	Van Large	392	15	6	3	153,319	2,322	630	348	1.51	0.41	0.23
Vehicle	Van Unknown	33	0	0	0	10,239	0	0	0	0.00	0.00	0.00
Vehicle	Pickup Compact	392	26	9	5	163,831	3,948	969	207	2.41	0.59	0.13
Vehicle	Pickup Large	817	45	18	4	329,775	6,609	2,270	514	2.00	0.69	0.16
Vehicle	Pickup Unknown	32	2	1	0	9,268	304	151	0	3.28	1.63	0.00
Vehicle	Light Truck Other	101	4	2	0	37,602	622	211	0	1.65	0.56	0.00
Vehicle	Light Truck Unknown	57	5	2	1	19,540	632	207	67	3.24	1.06	0.34

Table 7 (continued): Driver Injury Rates in NASS Towaway Crashes

----- DAMAGE=Unknown area -----

Crash Type	Vehicle Type	Investigated NASS Cases				Twelve-Year National Estimates				Injury Rates		
		Total	AIS>=2	AIS>=3	Fatal	Total	AIS>=2	AIS>=3	Fatal	AIS>=2	AIS>=3	Fatal
Object	Car Minicompact	121	15	7	2	49,043	2,773	888	228	5.65	1.81	0.46
Object	Car Subcompact	510	71	31	16	224,458	9,002	2,303	1,086	4.01	1.03	0.48
Object	Car Compact	555	88	34	18	214,883	11,001	2,419	734	5.12	1.13	0.34
Object	Car Intermediate	709	92	35	15	311,572	12,791	2,949	558	4.11	0.95	0.18
Object	Car Fullsize	525	76	38	15	183,986	12,961	4,122	614	7.04	2.24	0.33
Object	Car Largest	520	54	20	4	190,549	11,042	2,929	236	5.79	1.54	0.12
Object	Car Unknown	174	14	5	4	133,280	9,310	1,124	510	6.99	0.84	0.38
Object	Utility Compact	38	6	1	1	16,160	601	29	29	3.72	0.18	0.18
Object	Utility Large	22	2	1	0	8,802	155	16	0	1.76	0.18	0.00
Object	Utility Stationwagon	12	1	0	0	4,285	170	0	0	3.97	0.00	0.00
Object	Utility Unknown	2	0	0	0	1,568	0	0	0	0.00	0.00	0.00
Object	Van Minivan	26	5	3	1	14,755	479	207	117	3.25	1.40	0.79
Object	Van Large	105	13	7	1	50,210	3,050	2,499	8	6.07	4.98	0.02
Object	Van Unknown	6	0	0	0	2,510	0	0	0	0.00	0.00	0.00
Object	Pickup Compact	111	18	7	2	73,014	2,650	644	61	3.63	0.88	0.08
Object	Pickup Large	331	54	25	9	151,066	7,542	2,889	597	4.99	1.91	0.40
Object	Pickup Unknown	15	1	1	1	4,443	46	46	46	1.03	1.03	1.03
Object	Light Truck Other	34	5	2	1	13,919	859	388	66	6.17	2.79	0.48
Object	Light Truck Unknown	18	1	1	0	5,272	116	116	0	2.20	2.20	0.00
Unknown	Car Minicompact	264	50	14	3	114,629	5,024	1,392	268	4.38	1.21	0.23
Unknown	Car Subcompact	1,579	260	81	24	644,406	32,740	6,062	807	5.08	0.94	0.13
Unknown	Car Compact	1,593	242	97	33	691,709	32,767	7,499	1,147	4.74	1.08	0.17
Unknown	Car Intermediate	1,362	220	100	27	648,483	42,198	8,678	1,309	6.51	1.34	0.20
Unknown	Car Fullsize	761	95	43	16	350,050	15,318	2,791	812	4.38	0.80	0.23
Unknown	Car Largest	425	46	18	5	161,896	5,628	2,156	149	3.48	1.33	0.09
Unknown	Car Unknown	717	77	38	16	266,780	7,930	3,525	396	2.97	1.32	0.15
Unknown	Utility Compact	166	30	9	1	59,779	6,406	504	18	10.72	0.84	0.03
Unknown	Utility Large	45	7	2	0	13,448	2,828	155	0	21.03	1.15	0.00
Unknown	Utility Stationwagon	23	1	1	0	8,942	10	10	0	0.11	0.11	0.00
Unknown	Utility Unknown	9	0	0	0	1,287	0	0	0	0.00	0.00	0.00
Unknown	Van Minivan	134	18	3	0	44,677	4,445	602	0	9.95	1.35	0.00
Unknown	Van Large	208	27	12	3	66,723	4,348	1,618	82	6.52	2.42	0.12
Unknown	Van Unknown	33	5	2	0	9,198	186	109	0	2.02	1.19	0.00
Unknown	Pickup Compact	374	63	28	9	204,789	7,990	2,466	490	3.90	1.20	0.24
Unknown	Pickup Large	503	56	22	10	245,939	6,084	1,461	327	2.47	0.59	0.13
Unknown	Pickup Unknown	40	10	3	1	18,860	1,325	831	10	7.03	4.41	0.05
Unknown	Light Truck Other	42	8	5	2	20,766	672	390	27	3.24	1.88	0.13
Unknown	Light Truck Unknown	25	4	2	1	3,574	208	66	26	5.82	1.84	0.72

Table 8: Driver Injury Rates in NASS Towaway Crashes

-----DAMAGE=Unknown if rollover -----

Crash Type	Vehicle Type	Investigated NASS Cases				Twelve-Year National Estimates				Injury Rates		
		Total	AIS>=2	AIS>=3	Fatal	Total	AIS>=2	AIS>=3	Fatal	AIS>=2	AIS>=3	Fatal
Overall	All Light Vehicles	117	7	0	0	398,794	13,702	0	0	3.44	0.00	0.00
Overall	Car Unknown	98	5	0	0	332,329	9,799	0	0	2.95	0.00	0.00
Overall	Van Minivan	1	0	0	0	7,169	0	0	0	0.00	0.00	0.00
Overall	Van Large	4	0	0	0	7,423	0	0	0	0.00	0.00	0.00
Overall	Pickup Compact	3	0	0	0	11,449	0	0	0	0.00	0.00	0.00
Overall	Pickup Large	8	1	0	0	29,873	1,517	0	0	5.08	0.00	0.00
Overall	Pickup Unknown	1	0	0	0	216	0	0	0	0.00	0.00	0.00
Overall	Light Truck Other	2	1	0	0	10,333	2,385	0	0	23.08	0.00	0.00
Vehicle	All Light Vehicles	1	0	0	0	216	0	0	0	0.00	0.00	0.00
Unknown	All Light Vehilces	116	7	0	0	398,578	13,702	0	0	3.44	0.00	0.00
Vehicle	Pickup Unknown	1	0	0	0	216	0	0	0	0.00	0.00	0.00
Unknown	Car Unknown	98	5	0	0	332,329	9,799	0	0	2.95	0.00	0.00
Unknown	Van Minivan	1	0	0	0	7,169	0	0	0	0.00	0.00	0.00
Unknown	Van Large	4	0	0	0	7,423	0	0	0	0.00	0.00	0.00
Unknown	Pickup Compact	3	0	0	0	11,449	0	0	0	0.00	0.00	0.00
Unknown	Pickup Large	8	1	0	0	29,873	1,517	0	0	5.08	0.00	0.00
Unknown	Light Truck Other	2	1	0	0	10,333	2,385	0	0	23.08	0.00	0.00

Table 9: Moderate Injuries to Drivers of Towed Passenger Cars,
1993 NASS Data with Unknown Damage Types Prorated among the Known

Impact Type, Damage Area	NASS Cases	1993 NASS Weighted Data		
			Prorate A,B	Prorate C
Vehicle				
Rollover	26	945	985	985
Front	328	36,494	38,072	45,455
Side	253	22,105	23,061	27,533
Back	18	2,715	2,832	3,382
Other	1	30	31	37
Unknown area (A)	35	2,653		
Object				
Rollover	138	14,421	15,029	15,029
Front	210	20,892	21,602	25,791
Side	62	13,374	13,829	16,510
Back	2	220	227	272
Other	3	83	86	102
Unknown area (A)	18	1,175		
Unknown				
Rollover (B)	12	648		
Unknown area (C)	127	19,342	19,342	
Total	1,233	135,097	135,097	135,097

Table 10: Delta V in NASS Towaway Frontal Crashes Investigated Cases

Vehicle Type	Delta V (in Miles per Hour)								Total
Frequency	Unknown	00-09	10-19	20-29	30-39	40-49	50 +		
Car Minicompact	610	59	528	246	75	21	12		941
Car Subcompact	2655	365	2577	1091	284	61	37		4415
Car Compact	2436	481	2433	922	206	47	26		4115
Car Intermediate	2253	540	2051	720	187	46	19		3563
Car Fullsize	1448	387	1492	500	116	19	8		2522
Car Largest	1262	492	1155	344	78	14	5		2088
Car Unknown	32	4	6	0	1	0	0		11
Utility Compact	220	53	157	68	14	4	0		296
Utility Large	95	25	79	20	4	3	0		131
Utility Station.	53	10	38	7	0	0	0		55
Utility Unknown	9	0	2	0	1	0	0		3
Van Minivan	154	40	124	44	17	3	3		231
Van Large	380	108	239	63	22	10	4		446
Van Unknown	30	1	7	3	1	0	0		12
Pickup Compact	601	64	540	274	66	26	4		974
Pickup Large	1011	153	885	327	64	26	6		1461
Pickup Unknown	20	1	14	4	1	0	0		20
Light Truck Other	119	15	73	26	12	3	1		130
Total		2798	12400	4659	1149	283	125		21414

Frequency Missing = 13388

Table 11: Delta V in NASS Towaway Frontal Crashes
Nationally-Weighted Data

Vehicle Type	Delta V (in Miles per Hour)							Total
Frequency Row Percent	Unknown	00-09	10-19	20-29	30-39	40-49	50 +	
Car Minicompact	265073 .	27488 10.21	177814 66.04	53154 19.74	8365 3.11	1826 0.68	596 0.22	269242
Car Subcompact	1107935 .	152222 12.36	841541 68.31	199443 16.19	29911 2.43	6270 0.51	2512 0.20	1231899
Car Compact	934718 .	265777 21.63	763599 62.15	171321 13.94	21995 1.79	3841 0.31	2038 0.17	1228571
Car Intermediate	830154 .	275706 25.20	657663 60.11	129232 11.81	24729 2.26	4503 0.41	2338 0.21	1094172
Car Fullsize	496367 .	150171 21.99	421980 61.80	92692 13.57	15607 2.29	1341 0.20	1073 0.16	682865
Car Largest	459039 .	189228 31.22	344696 56.86	58714 9.69	11692 1.93	1198 0.20	648 0.11	606175
Car Unknown	7415 .	1792 62.07	851 29.47	0 0.00	244 8.45	0 0.00	0 0.00	2887
Utility Compact	111228 .	23464 30.85	38668 50.84	12654 16.64	1057 1.39	217 0.29	0 0.00	76060
Utility Large	31724 .	6480 21.48	19565 64.86	2873 9.52	949 3.15	298 0.99	0 0.00	30166
Utility Station- wagon	17207 .	5279 39.18	7375 54.74	818 6.07	0 0.00	0 0.00	0 0.00	13472
Utility Unknown	3676 .	0 0.00	1061 97.19	0 0.00	31 2.81	0 0.00	0 0.00	1092
Van Minivan	50826 .	11737 23.00	34125 66.87	2574 5.04	2376 4.66	46 0.09	176 0.35	51034
Van Large	112660 .	32682 31.26	60148 57.53	8516 8.14	2045 1.96	941 0.90	222 0.21	104554
Van Unknown	8426 .	328 11.51	1738 60.98	675 23.68	109 3.83	0 0.00	0 0.00	2850
Pickup Compact	229930 .	24139 8.96	185891 68.98	51058 18.95	5878 2.18	2295 0.85	217 0.08	269477
Pickup Large	352413 .	64852 15.09	292434 68.03	56952 13.25	10719 2.49	4436 1.03	498 0.12	429891
Pickup Unknown	6954 .	501 8.35	4115 68.70	1235 20.61	140 2.34	0 0.00	0 0.00	5991
Light Truck Other	28757 .	6639 14.78	30876 68.74	5007 11.15	2053 4.57	238 0.53	107 0.24	44919
Total	.	1238484	3884141	846916	137901	27449	10425	6145317

Frequency Missing = 5054501

Table 12: Driver Age in NASS Towaway Crashes
Investigated Cases

Vehicle Type	Driver Age							Total
	Frequency	Unknown	00-19	20-29	30-39	40-54	55-69	
Car Minicompact	25	752	1558	750	389	152	46	3647
Car Subcompact	102	3219	6905	3487	2059	1068	538	17276
Car Compact	125	2767	5537	3385	2320	1357	801	16167
Car Intermediate	167	2368	4694	2909	2257	1466	872	14566
Car Fullsize	116	1503	2888	1713	1593	1143	739	9579
Car Largest	129	1019	2126	1579	1411	977	503	7615
Car Unknown	45	219	562	325	240	125	67	1538
Utility Compact	9	277	619	445	265	87	19	1712
Utility Large	4	107	225	176	129	34	9	680
Utility Station.	5	36	37	73	64	33	7	250
Utility Unknown	3	5	12	12	6	2	0	37
Van Minivan	0	89	188	323	281	79	23	983
Van Large	18	144	653	585	483	228	33	2126
Van Unknown	2	15	54	44	38	11	5	167
Pickup Compact	29	671	1622	817	474	213	98	3895
Pickup Large	58	773	1940	1358	1088	624	195	5978
Pickup Unknown	4	26	63	36	21	15	8	169
Light Truck Other	11	69	216	152	107	56	8	608
Light Truck Unk.	3	11	44	29	18	9	2	113
Total	.	14070	29943	18198	13243	7679	3973	87106

Frequency Missing = 855

Table 13: Driver Age in NASS Towaway Crashes
Nationally-Weighted Data

Vehicle Type	Driver Age							Total
	Frequency	Unknown	00-19	20-29	30-39	40-54	55-69	
Row Percent
Car Minicompact	11449	293749	530807	249297	143026	50507	20247	1287633
	.	22.81	41.22	19.36	11.11	3.92	1.57	
Car Subcompact	64856	1271324	2391098	1240431	664608	318968	160322	6046750
	.	21.02	39.54	20.51	10.99	5.28	2.65	
Car Compact	74984	1060117	2094002	1127213	732319	424279	254048	5691979
	.	18.62	36.79	19.80	12.87	7.45	4.46	
Car Intermediate	105603	921380	1653082	1018708	821339	445499	237786	5097794
	.	18.07	32.43	19.98	16.11	8.74	4.66	
Car Fullsize	59570	505016	937046	526469	541309	352588	248705	3111134
	.	16.23	30.12	16.92	17.40	11.33	7.99	
Car Largest	84799	339012	683366	485795	439004	332392	159851	2439420
	.	13.90	28.01	19.91	18.00	13.63	6.55	
Car Unknown	38470	152657	381394	169379	101020	60968	23915	889333
	.	17.17	42.89	19.05	11.36	6.86	2.69	
Utility Compact	2966	89509	200481	169834	76758	25295	8963	570840
	.	15.68	35.12	29.75	13.45	4.43	1.57	
Utility Large	1660	30532	71890	55672	33977	8014	2868	202952
	.	15.04	35.42	27.43	16.74	3.95	1.41	
Utility Station-wagon	1009	11245	12007	30435	23325	7029	1922	85963
	.	13.08	13.97	35.41	27.13	8.18	2.24	
Utility Unknown	1301	2781	5326	4824	814	212	0	13955
	.	19.93	38.16	34.56	5.83	1.52	0.00	
Van Minivan	0	29000	44804	104924	102040	16264	13115	310147
	.	9.35	14.45	33.83	32.90	5.24	4.23	
Van Large	9333	53655	223203	165188	148540	56214	14827	661626
	.	8.11	33.74	24.97	22.45	8.50	2.24	
Van Unknown	94	4439	17591	10888	10803	5291	504	49516
	.	8.97	35.53	21.99	21.82	10.68	1.02	
Pickup Compact	22881	256988	606768	302130	158381	79933	46516	1450716
	.	17.71	41.83	20.83	10.92	5.51	3.21	
Pickup Large	43803	293031	720134	472871	380131	173618	63354	2103138
	.	13.93	34.24	22.48	18.07	8.26	3.01	
Pickup Unknown	1886	8837	24670	8821	8045	3799	3523	57696
	.	15.32	42.76	15.29	13.94	6.59	6.11	
Light Truck, Other	7111	34799	79687	47581	24740	14937	3053	204796
	.	16.99	38.91	23.23	12.08	7.29	1.49	
Light Truck, Unknown	1507	4012	12548	5299	5436	1799	589	29683
	.	13.52	42.27	17.85	18.31	6.06	1.98	
Total	.	5362083	10689903	6195758	4415614	2377606	1264108	30305072

Frequency Missing = 533280